STATEMENT OF WORK (SOW) FOR RI/FS

Purpose of the Statement of Work

This Draft Statement of Work (SOW) sets forth certain requirements of the Administrative Order on Consent (AOC) for implementation of the Work pertaining to a Remedial Investigation and Feasibility Study (RI/FS) for the Wilcox Oil Company Refinery Site (hereinafter "the Site"). The PRP (or selected contractor) shall undertake the RI/FS according to the AOC, including, but not limited to, this SOW.

Objectives of the Remedial Investigation/Feasibility Study

The objectives of the RI/FS are to investigate the nature and extent of contamination at the Site to evaluate the potential risk to human health and the environment, and to develop and evaluate potential remedial alternatives, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, 42 U.S.C. § 9601, et seg.); as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA); and in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan [NCP]). Specifically, these objectives are to determine the presence or absence, types, and quantities (concentrations) of contaminants; mechanism of contaminant release to pathway(s); direction-of-pathway(s) transport; boundaries of source(s) and pathway(s); environmental/public health receptors; and the potential risks to those receptors.

Scope of the Remedial Investigation and Feasibility Study

The general scope of the RI/FS shall be to address all contamination at the Site resulting from the hazardous substances present at the Site.

Description of the Site

Wilcox Oil Company is an inactive and abandoned oil refinery located in Creek County, Oklahoma. The site consists of contaminated areas and surface water bodies due to the release from the former Lorraine and former Wilcox Refineries. These refineries were located in the N ½ of the NW 1/4 of S29 T16N R9E and the SW 1/4 of the SW ¼ of S20 T16N R9E in Creek County, Oklahoma.

The geographical coordinates for the site are 35°50'26.8966" north latitude and 96°22'48:693" west longitude. The property covers approximately 125 acres.

Two refinery process facilities and storage tank areas once operated at the two facilities. Recent investigations (2009-2011) indicate the site area contains elevated concentrations of metals and organic compounds in the former storage tank areas, surface soils, surface impoundment and sediments. Levels of metals and/or oily non aqueous phase liquid (NAPLs) were also detected in three private residential wells on site, and from three wells adjacent to the property. A former church facility and six residents are presently on the Site.

A large volume of visible waste is present where refined product and crude oil storage tanks were once located. Approximately 4 inches of crude oil were discovered on the former church property when a cap broke off an existing pipeline. Hydrocarbon sheen was visible when digging 2-3 feet below ground surface. Elevated levels of metals and semi-volatiles are present in waste samples collected.

The site includes remnants of former oil refining operations and tank farms. The facility can be divided into three major former operational areas: two processing areas with surrounding refined product storage and a crude oil storage area. An active railroad divides the two former processing areas and product storage areas. Most of the refinery structures and tanks have been removed or are in ruins. The northwestern portion of the property, west of the railroad and north of West 221st Street South/Refinery Road, was used as a refined product storage area but is now rural land no longer used for refinery storage purposes. There are multiple areas of stressed vegetation, barren areas, and visible black tarry waste of a hydrocarbon nature.

A detailed title search in the Creek County Clerk office confirms that the property was used in oil refinery operations from 1915 until November 1963.

Role of EPA and the State

Unless identified otherwise, the EPA is the lead agency for this RI/FS investigation and the State, as represented by the Oklahoma Department of Environmental Quality (ODEQ), will serve as the support Agency. The EPA reserves the right to reverse these roles and delegated to the ODEQ the lead agency role.

The lead agency's (EPA's) approval of deliverables, including, but not limited to, submissions, is administrative in nature, and allows the PRP (or selected contractor) to proceed to the next steps in implementing the work of the RI/FS. The agency's approval does not imply any warranty of performance, nor does it imply that the RI/FS, when completed, will meet Performance Standards nor does it imply that the RI/FS will function properly and be ultimately accepted by the EPA. The EPA retains the right to disapprove submissions during the RI/FS.

Tasks to be Performed, Deliverables and Schedule

This SOW specifies the work to be performed and the deliverables which shall be produced by the PRP (or selected contractor). The RI/FS shall be conducted in accordance with this SOW and all applicable guidance that the EPA uses in conducting RI/FS projects under CERCLA, as amended by SARA, as well as any additional requirements by the State.

All draft and final deliverables specified in this SOW shall be provided in hard copy and electronic format, by the PRP (or selected contractor), to the EPA (three hard copies), and the ODEQ (two hard copies), and the Natural Resource Trustees' identified by the U.S. Department of the Interior (one hard copy each). Draft and Final deliverables shall be provided to these entities in Adobe® PDF *format.* Final deliverables shall be provided in hard copy and electronic format (specifically, Adobe® PDF format) to the Information Repository(ies) established for the

Site. Additionally, all deliverables specified in this SOW shall be submitted, by the PRP (or selected contractor), according to the requirements of this SOW.

Additionally, all deliverables specified shall be submitted, by the PRP (or selected contractor), according to the schedule presented in this SOW. See Appendix B (Acronyms, List of Deliverables and Schedule)

The PRP (or selected contractor) shall compile and review all existing Site data to describe additional data needed to characterize the Site, to better define potential applicable or relevant and appropriate requirements (ARARs), and to develop a range of preliminary identified remedial alternatives. This includes:

o All existing information describing hazardous substance sources on and near the Site (impoundments, lagoons, tanks, landfills and media etc.), migration pathways, and potential human and environmental receptors.
o Data describing all known sources, their location, containment, boundaries, physical characteristics and chemical constituents and their concentrations.
o Data relating to past disposal practices of any kind on and near the Site.
Data concerning the physical and chemical characteristics of the hazardous substances, and their distribution among environmental media (ground water, soil (surface and subsurface), surface water and air) on and near the Site.
o Data from previous responses and cleanup activities.
o Data from any previous sampling events on and near the Site.
o Data to identify location and use of wells on and near the Site.
o Data regarding background levels in the different environmental media.
o Data regarding demographics, and land use (present and future).
o Information regarding geology, hydrology, meteorology, and ecology of the Site.
o Information regarding groundwater and surface water use on and near the Site.
o Data describing the flora and fauna of the Site, threatened, endangered, or rare species, sensitive environmental areas, or critical habitats on or near the Site.

This SOW identifies typical activities the PRP (or selected contractor) may perform, but are not limited to the group shown. The work plan to be developed and submitted will include the above data and information as the site background and setting. The work plan will also provide a comprehensive description of the work to be performed, the methodologies to be utilized, and a corresponding schedule for completion. In addition, the work plan shall include the rationale for performing the required activities to obtain any missing data or information.

Specific required deliverables are identified within this SOW using "bold" and "italic".

The EPA may grant additional time to revise the deliverables depending upon the nature of the comments and the deliverable.

Tasks to be Performed by the PRP (or selected contractor)

The PRP (or selected contractor) shall perform each of the following Tasks (Tasks 1-14) as specified in this SOW, unless otherwise noted. These Tasks shall be developed in accordance with the guidance documents listed within this SOW and in Appendix A (Guidance Documents) to this SOW, and any additional guidance applicable to the RI/FS process.

The PRP (or selected contractor) shall furnish personnel, services, materials and equipment required to perform RI/FS activities in accordance with all applicable regulations and guidance including but not limited to OSWER Directive 9355.3-01, 10-88 (Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA). The following work breakdown structure shall be used for project scoping, scheduling, reporting, technical and cost tracking.

TASK 1 PROJECT PLANNING AND SUPPORT

This task includes work efforts related to project initiation and support. Typical activities the PRP (or selected contractor) may perform include but are not limited to:

o Attend scoping meeting.

Scoping meeting to occur within thirty (30) days after the effective date of the AOC.

o Conduct site visit.
o Develop work plan and associated cost estimate.

In developing the draft RI/FS Work Plan, the PRP (or selected contractor) must include and discuss the following main topics:

- Project Scope and Objectives
- Site Background and Setting
- Initial Evaluation (sources, types and volumes of waste, pathways, and receptors)
- Rationale and Work Plan Approach (Data Quality Objectives (DQOs), and Major Decisions)
- Tasks to be performed
- Schedule

Draft RI/FS Work Plan due within sixty (60) days after the scoping meeting. Amended Draft Work Plan within thirty (30) days after the receipt of the EPA's comments. Final Work Plan due within fourteen (14) days of the receipt of the EPA's approval of the Amended Draft RI/FS Work Plan.

o Negotiate work plan and make necessary revisions as a result of EPA comments and/or negotiated agreements.
o Provide conflict of interest disclosure.
o Evaluate existing data as directed by EPA.
o Develop a conceptual understanding of the site based on the evaluation of existing data (submit a Conceptual Site Model (CSM) sketch or diagram).

o The CSM identifies the sources of contamination, media, exposure pathways, and receptors that might be exposed. This is used in facilitating cleanup decisions during a site investigation and to plan the collection of data to support the risk assessment.

Draft Conceptual Site Model to be included with the Draft RI/FS Work Plan and subsequent revisions (Amended and Final Work Plan).

o Identify likely response scenarios and potentially applicable technologies and operable units that may address site problems (submit Technical Memorandum).
o Prepare conceptual exposure pathway analysis in accordance with Regional guidelines and OSWER Directives 9285.7-01B, 12/89 (Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part A.) and 9285.7-01A (Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual).
o Initiate identification of Applicable or Relevant and Appropriate Requirements (ARARs) that may affect remedy selection.
o Prepare a site specific Health and Safety Plan (HSP) that specifies employee training, protective equipment, medical surveillance requirements, standard operating procedures and a contingency plan in accordance with 29 CFR 1910.120 (l)(l) and (l)(2).

HSP due within sixty (60) days after the effective date of the AOC.

o Prepare a Field Sampling Plan (FSP) that describes the number, type, location of samples, type of analyses, QA/QC procedures, SOPs, chain of custody procedures, required detection limits and laboratory analytical methods.
o Prepare a Data Management Plan (DMP) and other plans as needed to support all work under this SOW.

Draft FSP due within sixty (60) days after the scoping meeting. Amended Draft FSP within thirty (30) days after the receipt of the EPA's comments. Final due within fourteen (14) days of the receipt of the EPA's approval of the Amended Draft FSP. Please note, Data Management Plan (DMP), Sample and Analysis Plan (SAP), Site Security Plan (SSP), Sample Management Plan (SMP) and other individual plans can be included and submitted within the FSP.

o Prepare a Quality Assurance Project Plan (QAPP) in accordance with EPA QA/R-5 (latest draft/revision). The plan shall describe the data quality objectives and measures necessary to achieve adequate data for use in remedy selection.

Draft QAPP due within sixty (60) days after the scoping meeting. Amended QAPP within thirty (30) days after the receipt of the EPA's comments. Final due within fourteen (14) days of the receipt of the EPA's approval of the Amended QAPP. Please note; the QAPP is a standalone document that cannot be combined with other documents. An approved QAPP is required before collecting any environmental data.

o Develop an EPA-approved laboratory quality assurance program that provides oversight of in-house and subcontracted laboratories through periodic performance evaluation sample analyses

and/or on-site audits of operations and has a system of corrective actions to be used in cases where performance does not meet the standards of the program.
o Develop/review qualifications of the laboratory for the given analytical requirements.
o Procure, manage, and provide oversight of pool and Team subcontracts for analytical services.
o Accommodate any external audit or review mechanism that EPA may require.
o Perform site specific project management (monitor costs, prepare Monthly Progress Report and Invoice).

Submit monthly report showing work completed, ongoing work, anticipated work/deliverables for the next two months and problems/delays. Initially due as specified in the RI/FS Work Plan. Thereafter, due by the tenth day of the following month.

Submit brief weekly status report by email to EPA and the ODEQ, highlighting upcoming deliverables, current submitted deliverables pending for review and comments. Due at the beginning of each week.

o Manage, track, and report status of site specific equipment.
o Prepare meeting minutes.
o In case of an EPA contractor, submit costs to the Contracting Officer for approval for RI/FS work assignment specific Pollution Liability Insurance, if the contractor plans to bill insurance premiums as a direct charge to the work assignment and there is no contract wide Pollution Liability Insurance. ***(NOTE: The Contractor shall track and report all costs associated with this sub-task separately and in accordance with the Reports of Work.)***

TASK 2 FIELD INVESTIGATION

This task includes work efforts to collect environmental data in support of the Remedial Investigation/Risk Assessment. Typical activities the PRP (or selected contractor) may perform include but are not limited to:

o Site Reconnaissance.
  -Ecological resources reconnaissance.
  -Well inventory.
  -Existing well development and establishment of sampling points.
  -Air/ gas emission sampling to evaluate vapor intrusion.
  -Surface geophysical survey.
  -On-Site and residential groundwater well sampling.
  -Surface water sampling.
  -Soil (surface and subsurface) Sampling.
  -Sediment sampling.
  -Leachate sampling.
  -Field Screening.
o Mobilization/Demobilization.
o Hydrogeological Assessment.
  -Test boring and monitoring well installation and development.
  -Downhole geophysics.

-Groundwater elevation measurements.
-Surface water elevation measurements.
-Hydraulic testing.

o Soil Boring, Drilling, and Testing.

o Environmental Sampling.

-Field screening.
-Groundwater sampling.
-Surface soil sampling.
-Soil boring/permeability sampling.
-Surface water and sediment sampling.
-Air monitoring.

o Ecological Characterization.

-Wetland and habitat delineation/function and value assessment.
-Wildlife observations.
-Benthic reconnaissance/community characterization.
-Identification of endangered species and others of special concern.
-Biota sampling/population studies.
-Bioassays.
-Bioaccumulation studies.

o Geotechnical Survey.

o Field generated waste characterization and disposal in accordance with Local, State and Federal Regulations.

After completing the field sampling and analysis and as specified in the project schedule in the Final RI/FS Work Plan, the PRP (or selected contractor) shall submit a concise Draft Preliminary Site Characterization Summary Report (PSCSR) to the EPA for review and approval. This report shall review the investigative activities that have taken place, and describe and display the Site's data documenting the location and characteristics of surface and subsurface features and contamination at the Site including the affected medium, location, types, physical state, and concentration and quantity of contaminants.

The Draft PSCSR shall provide the EPA and the PRP (or selected contractor) with a preliminary reference for developing the Baseline Human Health and Ecological Risk Assessments, evaluating the development and screening of remedial alternatives, and the refinement and identification of ARARs.

Draft PSCSR due as specified in the Final RI/FS Work Plan. Amended Draft due within thirty (30) days of the receipt of EPA's comments. Final due within fifteen (15) days of the receipt of the EPA's approval of the Amended Draft PSCSR.

TASK 3 SAMPLE ANALYSIS

This task includes the analysis of environmental and waste samples. The PRP (or selected contractor) may utilize or be directed to utilize a variety of mechanisms to implement this task including: field screening using mobile facilities or field portable equipment.

In case of EPA contractors, may utilize or be directed to utilize the Contract Laboratory Program (CLP), laboratories procured under sub pool or Team subcontracts, the Regional Environmental Services Division (ESD), the Environmental Response Team (ERT) laboratory, or Regionally procured laboratories.

This task consists exclusively of performance of sample analyses and production of analytical data.

TASK 4 ANALYTICAL SUPPORT AND DATA VALIDATION

This task includes work efforts involved in scheduling, coordination, tracking, and oversight of sample analyses and validation of analytical data produced. Typical activities the PRP (or selected contractor) may perform include but are not limited to:

o Collect, prepare, and ship environmental samples in accordance with the FSP (developed under Task 1). The following types of sampling may be required: -Field screening. -Groundwater sampling. -Surface and subsurface soil sampling. -Surface water and sediment sampling. -Air monitoring and sampling. -Biota sampling. -Other types of media sampling and screening.

o Develop DQOs for each sampling event; these DQOs shall be the determinative factor for assessing the success or failure of the sampling.

o Request, obtain, and perform oversight of analytical services in compliance with EPA requirements.

o In case of EPA contractor:

o coordinate with the EPA Sample Management Office (SMO), the Regional Sample Control Coordinator (RSCC), and/or the Environmental Services Division (ESD) regarding analytical, data validation, and quality assurance issues.

o Implement the EPA-approved laboratory quality assurance program which provides oversight of in-house and subcontracted laboratories through periodic performance evaluation sample analyses and/or on-site audits of operations and has a system of corrective actions.

o Provide sample management including chain-of custody procedures, information management, sample retention, and 10-year data storage.

o Perform data validation, the process by which the quality of the data, the defensibility of the data, and the chain of custody are verified. The PRP (or selected contractor) shall perform data validation in accordance with Regional guidelines. Data validation involves the overall laboratory analytical data quality assessment and usability processes.

o Review data for usability for its intended purpose.

o Provide reports on data validation and usability.

TASK 5 DATA EVALUATION

This task includes work efforts related to the compilation of Remedial Investigation (RI) analytical and field data. The data shall be entered into a Region-compatible computer data base and shall be utilized in the preparation of the RI and Risk Assessment Report tables, maps and figures. Typical activities the PRP (or selected contractor) may perform include but are not limited to:

- o Data usability evaluation/field QA/QC.
- o Data Reduction and Tabulation.
  - -Soil boring and monitoring well logs.
  - -Field sampling data.
  - -Hydrogeological testing data.
  - -Geophysical data (downhole geophysics, survey).
  - -Analytical results.
- o Environmental Fate and Transport Modeling/Evaluation.
- o Data trend evaluation and/or modeling and submission of Technical Memorandum.

TASK 6 ASSESSMENT OF RISK

This task includes work efforts to conduct a Baseline Risk Assessment and to prepare the necessary Risk Assessment documents. The objective of this assessment is to characterize and quantify where appropriate, the current and potential human health and environmental risks that would prevail if no further remedial action is taken.

The Risk Assessment must be done in accordance with the guidance, procedures, assumptions, methods and formats contained in:

o Human Health Evaluation Manual Supplemental Guidance: "Standard Default Exposure Factors" OSWER Directive 9285.6-03 (EPA, March 25, 1991).
o EPA Regional guidance as specified.
o Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A) Interim Final (EPA 540/1/-89, December 1989).
o Risk Assessment Guidance for Superfund (RAGS): Part D, Volume I: Human Health Evaluation Manual (Part D, Standardized Planning, Reporting and Review of Superfund Risk Assessments) Final December 2001 (effective immediately for all new CERCLA risk assessments)
o Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation (EPA 540/1-89/001, March 1989).
o Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final (EPA 540-R-97-006, June 1997)
o Guidance for Data Useability in Risk Assessment (EPA/540/G-90/008, September 1990).
o Air/Superfund National Technical Guidance Study Series Volumes I, II, III, and IV (EPA 450/1-89- 001, 002, 003, 004, July 1989). o Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference Document (EPA 600/3-89/013, March 1989).

o The Baseline Risk Assessment shall be separated into separate components: (1) Human Health Risk Assessment (HHRA), (2) Screening Level Ecological Risk Assessment (SLERA) and (3) Baseline Ecological Risk Assessment (BERA).

o The Human Health Risk Assessment shall address the following:

- o Hazard identification.
- o Dose-response assessment.
- o Exposure assessment.
- o Risk characterization.
- o Limitations/uncertainties.
- o Site conceptual model.

Draft due as specified in the Final RI/FS Work Plan. Amended Draft due within forty-five (45) days of the receipt of EPA's comments. Final due within thirty (30) days of the receipt of the EPA's approval of the Amended Draft RI/FS HHRA.

o The Screening Level Ecological Risk Assessment shall address the following:

- o Definition of objectives.
- o Characterization of site and potential receptors.
- o Selection of chemicals, indicator species, and end points for risk evaluation.
- o Exposure assessment.
- o Toxicity assessment/ecological effects assessment.
- o Risk characterization.
- o Limitations/uncertainties.
- o Site conceptual model.

Draft SLERA due as specified in the Final RI/FS Work Plan. Amended Draft due within forty-five (45) days of the receipt of EPA comments. Final due within thirty (30) days of the receipt of the EPA's approval of the Amended Draft RI/FS SLERA.

o The ecological risk assessment guidance for Superfund is composed of eight steps and several scientific/management decision points (SMDPs). The first two steps result in the Screening Level Ecological Risk Assessment (SLERA). Upon delivery and review of the SLERA by the risk managers and the risk assessment team, a decision about whether a full baseline ecological risk assessment (BERA) is made. If the process stops at this point, the decision not to continue is documented in a SMDP. If the process continues, the assessment continues through the remaining steps and SMDPs listed in the guidance.

If the decision is to continue the process.

Draft BERA due as specified in the Final RI/FS Work Plan. Amended Draft due within forty-five (45) days of the receipt of EPA comments. Final due within thirty (30) days of the receipt of the EPA's approval of the Amended Draft RI/FS BERA.

TASK 7 TREATABILITY STUDY/PILOT TESTING

This task includes work efforts related to the conduct of laboratory screening, bench-scale and pilot-scale treatability studies to determine the suitability of remedial technologies or alternatives to site conditions and problems. Typical activities the PRP (or selected contractor) may perform include but are not limited to:

o Provide test facility and equipment.
o Test and operate equipment.
o Retrieve sample for testing.
o Prepare Technical Memorandum.
o Characterization and disposal of residuals in accordance with Local, State and Federal Regulations.
o Prepare Treatability Study Work Plan (TSWP), including separate Health and Safety Plan (HSP) and Sampling and Analysis Plan (SAP).

Draft due within sixty (60) days of the receipt of EPA's notice that treatability studies are required. Amended Draft due within thirty (30) days of the receipt of the EPA's comments. Final due within fourteen (14) days of the receipt of the EPA's approval of the Amended Draft TSWP and SAP.

o Prepare Treatability Study Report (TSR) analyzing and interpreting the testing results.
o The report must evaluate each candidate technology's effectiveness, implementability, cost, and actual results as compared with predicted results.
o This includes evaluation of full-scale application of the candidate technologies, including a sensitivity analysis indentifying the key parameters affecting full-scale operation

Draft due as specified in the Final Treatability Study Work Plan. Amended Draft due within forty-five (45) days of the receipt of the EPA's comments. Final due within thirty (30) days of the receipt of the EPA's approval of the Amended Draft TSR.

TASK 8 REMEDIAL INVESTIGATION REPORT

This task includes work efforts related to the preparation of findings once data has been evaluated. The RI shall provide information to assess risks to human health and the environment and to support the development, evaluation and selection of appropriate response alternatives. The task includes all draft and final reports. The RI report shall be written in accordance with "Guidance for Conducting Remedial Investigations/Feasibility Studies under CERCLA," OSWER Directive 9355.3-01, October 1988, Interim Final (or latest revision) and "Guidance for Data Usability in Risk Assessment," (EPA/540/G-90/008), September 1990 (or latest revision).

The RI report shall include a discussion of the following:

o Site Background.

o Investigation.
    -Field Investigation and technical approach.
    -Chemical analyses and analytical methods.
    - Field methodologies (biological, surface water, sediment, soil boring, soil sampling, monitoring well installation, groundwater sampling, hydrogeological assessment).
o Site Characteristics.
    -Geology.
    -Hydrogeology.
    -Meteorology.
    -Demographics and land use.
    -Ecological assessment.
o Nature and Extent of Contamination.
    -Contaminant sources.
    -Contaminant distribution and trends.
o Fate and Transport.
    -Contaminant characteristics.
    -Transport processes.
    -Contaminant migration trends.
o Summary and Conclusions.

The RI Report is prepared after completion of all the risk assessments and must summarize results of field activities to characterize the site, sources of contamination, nature and extent of contamination and the fate and transport of contaminants.

In developing the RI Report, the PRP (or selected contractor) must follow the FI Report format described in Table 3-13 of the RI/FS Guidance. The RIS Report must include text covering all the topics listed in Table 6-5.

Draft due as specified in the Final RI/FS Work Plan. Amended Draft due within forty-five (45) days of the receipt of the EPA's comments. Final due within thirty (30) days of the receipt of the EPA's approval of the Amended Draft RI Report.

TASK 9 REMEDIAL ALTERNATIVES SCREENING

This task includes work efforts to develop appropriate remedial alternatives to undergo full evaluation (Task 12). The alternatives are to encompass a range including innovative treatment technologies consistent with the regulations outlined in the National Contingency Plan (NCP), 40 CFR Part 300 and the Guidance for Conducting Remedial Investigations and Feasibility studies under CERCLA (OSWER Directive 9355.3-01 and other OSWER Directives including 9355.4-03, October 18, 1989, and 9283.1-06, May 27, 1992, "Considerations in Ground Water Remediation at Superfund Sites"). Typical activities the PRP (or selected contractor) may perform include but are not limited to:

o Establish remedial action objectives.
o Establish general response actions.

o Identify and screen applicable remedial technologies.
o Develop remedial alternatives in accordance with Section 300.430(e) of the NCP (1990).
o Screen remedial alternatives for effectiveness, implementability and cost.
o Prepare Technical Memorandum.

Draft Alternatives Screening Technical Memorandum due as specified in the Final RI/FS Work Plan. Amended Draft due within thirty (30) days of the receipt of the EPA's comments. Final due within fourteen (14) days of the receipt of the EPA's approval of the Amended Draft.

TASK 10 REMEDIAL ALTERNATIVES EVALUATION

This task includes efforts associated with the assessment of individual alternatives against each of the nine evaluation criteria and a comparative analysis of all options against the evaluation criteria. The analysis shall be consistent with the National Contingency Plan (NCP), 40 CFR Part 300 and shall consider the Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA (OSWER Directive 9355.3-01) and other pertinent OSWER guidance. EPA will make the determination regarding final selection of the remedial alternative.

A preliminary list of probable Applicable or Relevant and Appropriate Requirements (ARARs) will be generated by the PRP (or selected contractor) during the Remedial Investigation and Feasibility Study process. This list will be compiled according to established EPA guidance, research of existing regulations, and collection of site-specific information and data. Three types of ARARs will be identified:

1) Chemical-Specific ARARs: These ARARs are usually health- or risk-based numerical values or methodologies used to determine acceptable concentrations of chemicals that may be found in or discharged to the environment (e.g., maximum contaminant levels that establish safe levels in drinking water).
2) Location-Specific ARARs: These ARARs restrict actions or contaminant concentrations in certain environmentally sensitive areas. Examples of areas regulated under various Federal laws include floodplains, wetlands, and locations where endangered species or historically significant cultural resources are present.
3) Action-Specific ARARs: These ARARs are usually technology- or activity-based requirements or limitations on actions or conditions involving specific substances.

The nine criteria the PRP (or selected contractor) shall employ in evaluation of remedial alternatives are:

o Overall protection of human health and the environment.
o Compliance with ARARs.
o Long-term effectiveness and permanence.
o Reduction in toxicity, mobility or volume through treatment.
o Short-term effectiveness.

o Implementability - technical and administrative.
o Cost.
o State acceptance.
o Community acceptance.
o -The final two criteria, state or support agency acceptance and community acceptance, will be evaluated following comment on the RI/FS report and the proposed plan and will be addressed once a final decision is being made and the Record of Decision is being prepared.

This task requires:

o Complete screening of remedial alternatives against the nine criteria and ARARs.
o Cost estimates are developed at both the "screening of alternatives" and "detailed analysis of alternatives" phases of the FS, with expected accuracy ranges of –50 to +100 percent and –30 to +50 percent, respectively.
o A discount rate of 7% should generally be used in developing present value cost estimates for remedial action alternatives. (Based on EPA policy stated in the preamble to the NCP and OWSER Directive 9355.3-20)
o Prepare Technical Memorandum.

Draft Alternative Evaluation Technical Memorandum due as specified in the Final RI/FS Work Plan. Amended Draft due within thirty (30) days of the receipt of the EPA's comments. Final due within fourteen (14) days of the receipt of the EPA's approval of the Amended Draft ARAR Report.

TASK 11 FS REPORT AND RI/FS REPORT

This task includes work efforts related to the preparation of findings once remedial alternatives have been screened and evaluated. The task includes preparation of all draft and final reports. The Feasibility Study Report shall include a discussion of the following:

o Feasibility Study Objectives.
o Remedial Action Objectives.
o General Response Actions.
o Identification and screening of Remedial Technologies.
o Remedial Alternatives Description.
o Detailed Analysis of Remedial Alternatives (individual and comparative).
o Summary and Conclusions.

In developing the Feasibility Study (FS) Report, the PRP (or selected contractor) must follow the FS Report format described in Table 6-5 of the RI/FS Guidance. The FS Report must include text covering all the topics listed in Table 6-5.

Draft FS Report due as specified in the Final RI/FS Work Plan. Amended Draft FS Report due within thirty (30) days of the receipt of the EPA's comments. Final Amended FS Report due within fourteen (14) days of the receipt of the EPA's comments.

TASK 12 POST RI/FS SUPPORT

This task includes efforts to support the Agency's Record of Decision (ROD). The final recommendation contained in the ROD shall represent the opinion and recommendation of EPA not that of the PRP (or selected contractor). Typical activities the PRP (or selected contractor) may perform include but are not limited to:

- o Attend public meetings, briefings, public hearings, technical meetings with PRPs.
- o Prepare presentation materials.
- o Provide technical assistance in the preparation of the Responsiveness Summary.
- o Provide technical assistance in the preparation of the Proposed Plan and ROD.

EPA will identify and select the preferred alternative, prepare the Proposed Plan, conduct the public meeting and complete the ROD.

- o If needed, in response to public comments, assist EPA in preparing a Feasibility Study Addendum.

TASK 13 ADMINISTRATIVE RECORD

This task is not active; EPA will develop the Administrative Record and Administrative Record Index

TASK 14 WORK ASSIGNMENT CLOSE OUT

This task includes efforts related to work assignment close out. Typical activities the PRP (or selected contractor) may perform include but are not limited to:

- o Return of documents to EPA or other document repositories.
- o File duplication, distribution, and storage.
- o File archiving to meet Federal Records Center requirements.
- o Use of microfiche, microfilm, or other EPA-approved data storage technology.
- o Prepare a Work Assignment Close-out Report (WACR) in accordance with Regional guidance or other procedures as specified in the work assignment.

Appendix A (Guidance Documents)

REFERENCES

The following list, although not comprehensive, contains many of the regulations and guidance documents that apply to the RI/FS process:

1. National Oil and Hazardous Substances Pollution Contingency Plan (The NCP), 40 C.F.R. Part 300

2. "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01. http://www.epa.gov/superfund/policy/remedy/pdfs/540g-89004-s.pdf

3. "Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies," U.S. EPA, Office of Waste Programs Enforcement, OSWER Directive No. 9835.3.

4. "Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents," U.S. EPA, Office of Solid Waste and Emergency Response, EPA 540-R-98-031, July 1999, OSWER Directive No. 9200.1-23P.

5. "A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

6. "EPA NEIC Policies and Procedures Manual," May 1978, revised November 1984, EPA-330/9-78-001-R.

7. "Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements," U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

8. "CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (draft), OSWER Directive No. 9234.1-01 and -02.

9. "Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S. EPA, Office of Emergency and Remedial Response, (draft), OSWER Directive No. 9283.1-2.

10. "Draft Guidance on Preparing Superfund Decision Documents," U.S. EPA, Office of Emergency and Remedial Response, March 1988, OSWER Directive No. 9355.3-02

11. "Performance of Risk Assessments in Remedial Investigation/Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)," August 28, 1990, OSWER Directive No. 9835.15.

12. "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," April 22, 1991, OSWER Directive No. 9355.0-30.

13. OSHA Regulations at 29 C.F.R. 1910.120

14. "Final Guidance on Administrative Records for Selecting CERCLA Response Actions," U.S. EPA, Office of Waste Programs Enforcement, December 3, 1990, OSWER Directive No. 9833.3A.

15. "Community Relations in Superfund: A Handbook," U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.0#3B.

16. "Community Relations During Enforcement Activities And Development of the Administrative Record," U.S. EPA, Office of Programs Enforcement, November 1988, OSWER Directive No. 9836.0-1A.

17. EPA 1997. "Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments." Office of Emergency and Remedial Response. EPA/540-R-97-006. June 5, 1997.

18. U.S. Environmental Protection Agency (EPA) 1987a. "Data Quality Objectives for Remedial Response Activities." Office of Emergency and Remedial Response and Office of Waste Programs Enforcement. EPA/540/G-87/003. OSWER Directive No. 9335.0-7b. March 1987.

19. EPA 1991a. "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors." Office of Emergency and Remedial Response. OSWER Directive No. 9235.6-03. March 1991.

20. "Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part A)," December 1989, EPA/540/1-89/002.

21. EPA 1991b. "Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part B), Development of Risk-Based Preliminary Remediating Goals." Office of Emergency and Remedial Response. OSWER Directive No. 9285.7-01B. December 1991.

22. EPA 1991c. "Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part C), Risk Evaluation of Remedial Alternatives." Office of Emergency and Remedial Response. OSWER Directive No. 9285.7-01C. 1991.

23. EPA 1992a. "Guidance for Data Useability in Risk Assessment." Office of Emergency and Remedial Response. OSWER Directive No. 9285.7-09A. April 1992 (and Memorandum from Henry L. Longest dated June 2, 1992).

24. "Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual. Supplemental Guidance. Dermal Risk Assessment." Interim Guidance, 1998.

25. "Risk Assessment Guidance for Superfund - Volume II Environmental Evaluation Manual," March 1989, EPA/540/1-89/001.

26. EPA 1992b. "Supplemental Guidance to RAGS: Calculating the Concentration Term." Office of Emergency and Remedial Response. OSWER Directive No. 9285.7-081. May 1992.

27. EPA 1993a. "Data Quality Objectives Process for Superfund." Office of Solid Waste and Emergency Response. EPA/540-R-93-071. September 1993.

28. EPA 1998a. "Risk Assessment Guidance for Superfund, Volume 1 - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments). Interim. Process for Designing and Conducting Ecological Risk Assessments." Office of Solid Waste and Emergency Response. EPA/540-R-97-033. January 1998. Publication 9285.7-47, Final, December 2001.

29. EPA 1998b. "EPA Guidance for Quality Assurance Project Plans." Office of Research and Development. EPA QA/G-5. EPA/600/R-98/018. February 1998.

30. EPA 2001. "EPA Requirements for Quality Assurance Project Plans." Office of Environmental Information. EPA QA/R-5. EPA/240/B-01/003. March 2001.

31. "Health and Safety Requirements of Employees Employed in Field Activities," U.S. EPA, Office of Emergency Response, July 12, 1981, EPA Order No. 1440.2.

32. "Exposure Factors Handbook", EPA, 1997.

33. Integrated Risk Information System (IRIS), 2000.

34. "Health Effects Assessment Summary Tables (HEAST), "U.S. EPA, Office of Solid Waste and Emergency Response, 1997, EPA/540/R-95/036.

35. "Guidance for Conducting Non-Time-Critical Removal Actions Under CERCLA", U.S. EPA, Office of Emergency and Remedial Response, August 1993, OSWER Directive No. 9360.0-32.

36. Guide for Conducting Treatability Studies Under CERCLA, Final. U.S. EPA, Office of Solid Waste and Emergency Response, EPA/540/R-92/071a, October 1992.

37. Guide to Management of Investigation-Derived Wastes, U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9345.3-03FS, January 1992.

38. Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, U.S. EPA, Office of Solid Waste and Emergency Response, EPA-540-R-05-012, OSWER 9355.0-85, December, 2005.

39. Revised Policy on Performance of Risk Assessments During Remedial Investigation/Feasibility Studies (RI/FS) Conducted by Potentially Responsible Parties, U.S. EPA, Office of Solid Waste and Emergency Response, OSWER directive No. 9835.15c, Jan 1996.